

as shown for instance by the occurrence of several epiphytal Orchids; whereas even in equal isothermal zones none are represented by equivalent exponents in the whole flora of Europe anywhere.

ON THE EXISTENCE AFTER PARTURITION OF A DIRECT COMMUNICATION BETWEEN THE MEDIAN VAGINAL CUL-DE-SAC SO-CALLED,
AND THE UROGENITAL CANAL, IN CERTAIN SPECIES
OF KANGAROOS.

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I. Introductory.

"In the Marsupialia the female organs consist of two ovaries, two oviducts or fallopian tubes, two uteri, two vaginae, an urogenital canal, and a clitoris" (Owen). While the presence of two vaginae is constant throughout the group, there is considerable variation in the relation of the two vaginae to one another. Thus, again quoting from Vol. III. of Prof. Owen's Comparative Anatomy, "in *Didelphis dorsigera*, each vaginal tube after embracing the os tinae is immediately continued upwards and outwards, then bends downward and inward, and after a second bend upward, descends by the side of the opposite tube to terminate parallel with the urethra, in the common or urogenital passage. In *Petaurus* the vaginae * * * descend close together half-way toward the urogenital passage, and there terminate blindly without intercommunication. From the upper part of these culs-de-sac the vaginae are continued upward and outward, forming a curve, like the handles of a vase, then descend, converge, and terminate close together as in the preceding example. In *Dasyurus viverrinus*, and *Didelphis virginiana* the mesial culs-de-sac of the vaginae descend to the urogenital passage, and are connected to it, but do not communicate with it or with one another. In the

Wombat (*Phascolomys*) each uterus communicates with a separate and large vaginal cul-de-sac."

In the kangaroos with which we are now more immediately concerned the two vaginae give rise to but one so-called mesial cul-de-sac, which however shows a more or less complete longitudinal septum. In *Macropus major* Prof. Owen describes the following condition: "the vaginae preponderate in size greatly over the uteri; and the septum of the descending cul-de-sac being always more or less incomplete, a single cavity is thus formed, into which both uteri open; but however imperfect the septum may be, it always intervenes and preserves its original relations to the uterine orifices. In the specimen examined by me, this part of the vagina was not continuous by means of its proper tissue with the urogenital canal, but was connected thereto by areolar tissue. In *Halmaturus Bennetti*, I found an aperture of communication between the median cul-de-sac and the urogenital canal; and as the same structure has been observed in two other specimens, it is doubtless normal, at least after parturition. The fact however does not justify the conclusion that the lateral vaginal canals convey exclusively the semen for impregnation, and that the median canals, which as a rule, are closed and distinct from one another, serve only to transmit the foetus to the urogenital passage."

Referring to the reproductive organs of Marsupialia, the English translation of Prof. Gegenbaur's Manual (p. 616) states as follows; "each of the two uteri opens by a papilliform process into a portion, which from the exterior appears to be common to both, and which is formed by the union of the two Mullerian ducts. A curved vagina is given off from this on either side (*Didelphys*), or the commencement of the tube is replaced by a caecal vaginal sac which is pushed out backwards, and is usually, though not always, divided internally by a median partition; from this sac the distinct vaginal canals pass in a curved direction to the urogenital sinus, (*Halmaturus*)."

The cæcal conditions of the median vaginal sac described by Prof. Owen in *M. major*, and by Prof. Gegenbaur in *Halmaturus* sp. have been shewn by several observers not to obtain in other species of kangaroos, but to be replaced, at any rate after parturition, by the condition met with by Prof. Owen and two other anatomists, in *H. Bennettii*. This interesting condition, beyond the passing allusion of Prof. Owen to its occurrence in one species already quoted, is not mentioned in any of the text books most used by English students, and does not seem to have met with the attention it deserves. Before giving an account of some observations which I have recently had the opportunity of making, the results arrived at by previous observers will be pretty fully stated, since much of the literature relating to Marsupial anatomy in general and to this point in particular, is not accessible in this colony.

II. Historical.

The female organs of the kangaroo were first described by Sir Everard Home in 1795. The following extracts from his paper* bear on the subject, but it must be remembered that when this writer uses the terms, uterus, vagina, and lateral canals, he refers to what are now regarded as being mesial cul-de-sac, urogenital passage and lateral vaginal canals, respectively. Home says: "the vagina itself is about $1\frac{1}{2}$ in. in length, beyond which it is divided into two separate canals, and on the ridge which lies between them opens the meatus urinarius leading to the urinary bladder. * * * * The uterus itself is extremely thin and membranous in its coats, infundibular in its shape and situated in the middle space between these canals; it is largest at its fundus, and becomes smaller and smaller towards the meatus urinarius where it terminates: the uterus at that part in the virgin state being impervious."

*Phil. Trans., Vol. lxxxv., 1795, pp. 222-230.

Again on p. 228, speaking of the impregnated uterus Sir Everard says "the uterus and two lateral canals have their cavities very much increased in size but that of the uterus is the most enlarged: the communication between these canals and the vagina is completely cut off, by the constricted part close to the vagina being filled with a thick inspissated mucus; and in this state of the parts there is an orifice very distinctly to be seen close to the meatus urinarius, large enough to admit a hog's bristle, leading directly into the uterus where in the virgin state no such passage could be observed."

Finally on p. 229 of his paper Home says that "immediately after parturition, the parts are nearly brought back into their original state, the only circumstance deserving of notice is, that the opening leading directly from the uterus to the vagina, which is not met with in the virgin state, after being enlarged by the passage of the fœtus, forms a projecting orifice and almost wholly conceals the meatus urinarius."

Substantially the same views are stated in Vol. III., Lect. xii., of the same writer's *Lectures on Comparative Anatomy*.

Cuvier in his *Leçons d'Anat. Comp.*, says that he found no opening in the mesial cul-de-sac as described by Home. Not having the opportunity of again referring to the *Leçons* I am unable to give Cuvier's exact words.

In 1828 Seiler published a paper* founded upon the dissection of a female kangaroo and its mammary fœtus. Referring to the point now in question, he says: "One still finds in several recent memoirs, the old opinion repeated, that at the time of the first delivery of the fœtus an aperture in the neck of the uterus originates immediately behind the opening of the urethra, through which the embryo is born. This view seemed so improbable to me, notwithstanding Home's observations in favour of it, that I not only examined the uterus very carefully, but also so

* *Isis von Oken*, Vol. xii., 1828, pp. 475-477.

thoroughly injected it with mercury from one of the Fallopian tubes, that it was put completely on the stretch, yet no trace of an opening was to be seen, and it is to me not at all doubtful that the embryo is born through the lateral canals of the uterus."

Carus* in 1824 had the opportunity of dissecting a female kangaroo with a mammary foetus. He found that a communication existed between the mesial vaginal sac and the urogenital passage, and though its aperture was glued-up there was no considerable resistance offered to the passage of a probe. It would also appear that, in the main, Carus accepted Home's views. In this, as in the two previous cases, the animals are merely spoken of as "kangaroos" without being referred to any genera.

In 1834 Prof. Owen† published his paper "On the generation of the Marsupial animals with a description of the impregnated uterus of the Kangaroo," in which he states as follows:—"The foetus has been conjectured to pass into the urethro-sexual cavity by a direct aperture formed after impregnation at the lower blind end of the cul-de-sac, but I have not been able to discover any trace of such a foramen in two kangaroos which had borne young; and besides, I find that this part of the vagina is not continuous by means of its proper tissue with the urethro-sexual passage, but is connected to it by cellular membrane only; and this structure is agreeable to what is presented in the simpler forms of the marsupial uterus, as in *D. dorsigera* and the *Petauri*, in which the culs-de-sac do not even come into contact with the urethro-sexual passage." The same statement is repeated in the same author's article Marsupialia in Todd's Cyclopædia Vol. III. (1841) and the following reference to Home's paper is made on p. 319. "I have already shewn that one of the chief grounds of the theory of marsupial generation there proposed is untenable,

*Lehrbuch der vergl. Zootomie.

†Phil. Trans., Vol. cxxiv., 1834, pp. 333-364.

the supposed remains of the fœtus, described as being situated in the corpus uteri, (vaginal cul-de-sac) being nothing more than a portion of the inspissated secretion commonly present both in this sac and the lateral canals. The temporary orifice by which the fœtus is stated to pass immediately from the so-called corpus uteri into the vagina (urogenital passage) does not exist."

In the same distinguished observer's * notes (1834) on the dissection of a female specimen of *Macropus Parryii* it is stated that "the mesial cul-de-sac of the vagina did not extend quite so far down in *M. Parryii*, as it does in the better-known species."

Professor Poelman† of Ghent, published in 1851, an account of his dissection of the female organs of *Halmaturus Bennettii*, in which he states that the median vaginal canal communicated freely with the urogenital sinus.

In 1852 Prof. Owen‡ examined a female *Dendrolagus inustus*, of which he says, "the lateral bent vaginal canals are shorter in proportion than in the *M. major*: but the median cul-de-sac was closed, as in that species." In the same paper the following statement is made. "In a specimen of the *M. Bennettii*, which I dissected in 1845, I detected a natural aperture of communication between the median cul-de-sac and the urogenital canal. I had the pleasure of showing the specimen to Dr. Poelman,* * * and of thus confirming the observation which he had, independently, made of a similar modification of the female generative organs in a specimen of the *Macropus Bennettii*, dissected by him at the University of Gand."

In 1857 Vrolik§ published a monograph on the anatomy of *Dendrolagus inustus*, in which, speaking of the median cul-de-sac he says that it was a blind sac without any trace of the opening

* P.Z.S., Pt. ii., 1834, pp. 151-152.

† Bull. de l'Acad. des Sci. de Belgique, Tome xviii., 1851, Pts. I. and II.

‡ P.Z.S., Pt. xx., 1852, p. 106.

§ Ontleedkundige Nasporingen omtrent *D. inustus*. Amsterdam 1857.

which Poelman and Owen had met with in *Halmaturus Bennettii*, and which he himself had met with in *H. Billiardieri*.

In 1866 Alix * met with the open condition in a specimen of *H. Bennettii*, and seemingly unaware of the papers mentioned above, published this discovery as a new one. To this both Owen† and Poelman‡ replied pointing out the facts of the matter. From their replies the following extracts are made: "Dans le Macropus, les culs-de-sac vaginaux communiquent entre eux, et la cavité commune s'étend jusqu'au vestibule uréto-genital, mais sans y déboucher. C'est ce que j'ai constaté chez des femelles de l'espèce *M. major*, qui avaient fait des petits au moins deux fois. Dans l'*Halmaturus* le cul-de-sac non seulement atteint le fond du vestibule uréto-genital, mais il y débouche, comme ou l'a montré depuis longtemps."—(Owen), and "J'ajouterai que, depuis la publication de ce travail (that is Poelman's paper supra), j'ai eu l'occasion de vérifier cette disposition anatomique (that is the open condition) chez d'autres individus appartenant à la même espèce, et en ce moment je ne conserve plus aucun doute sur son existence constante."—(Poelman).

In 1867 Prof Lucä§ published an account of his investigations made upon three females, two of which belonged to *H. Bennettii* and the third to *H. Billiardieri*. The latter and one of the former were adult, and in each case a direct communication existed between the median vaginal cul-de-sac and the urogenital passage. In the third example, which was a not full grown specimen of *H. Bennettii*, Lucä found no trace of an opening either in the mucous membrane of the vaginal cul-de-sac, or in that of the urogenital passage, and that the two mucous mem-

* Paris, Acad. Sci. Compt. Ren. lxii., 1866, pp. 146-141 and Ann. Mag. Na. Hist. 1866.

† Paris, Acad. Sci. Compt. Rend., lxii., 1869.

‡ Paris, Acad. Sci. Compt. Rend. lxii., 1866, pp. 399-400.

§ Der Zoologische Garten, Frankfurt, Vol. viii., 1867.

branes were separated from one another by a layer of connective tissue $\frac{1}{8}$ mm. thick.

In 1868 the same observer * examined a second adult *H. Bennettii*, which had a mammary foetus from 2.2 $\frac{1}{2}$ in. long in the pouch. In this specimen also the median vaginal canal directly communicated with the urogenital canal.

The third volume of Prof. Owen's Comp. Anatomy was published in 1868, but beyond the reference to *H. Bennettii* already quoted, it does not further allude to the subject now in review.

Prof. Fagenstecher † of Heidelberg in 1871 examined the organs of a pregnant female *Macropus major* in which he found the median vaginal cul-de-sac closed.

The late Prof. Garrod ‡ writing in 1875, of *Dorcopsis luctuosa* says: the "uterus is perfectly macropine, as are the vaginae. No direct communication could be found between the uterine pouch of the vagina and the common vaginal canal."

In 1879, Alix § published a preliminary account of his researches upon the female organs of certain kangaroos. He says that with regard to *Halmaturus*, he has had the opportunity of several times verifying his previous observation. He also says that in a specimen of *M. major* he met with the closed condition as described by Cuvier and Owen. Further in two specimens of *Macropus rufus*, which were mother and daughter, the latter being one-third the size of the former, the same observer found that the direct communication was present in the one and absent in the other. Finally Alix says he has found the direct communication in a *Wombat*.

*Der Zoologische Garten, Frankfurt, Vol. ix., 1869.

†Ann. Mag. Nat. Hist., 1871, pp. 292-294.

‡P.Z.S., 1875.

§Bull. Soc. Zool. de France, 1879, p. 118.

In 1880 Arnold Brass * published a thesis in which he figures and describes the female organ of *M. major* and *Halmaturus Bennettii*. His results entirely agree with those of Prof. Owen in reference to individuals of the same two species. He also speaks of a third specimen which was given to him as belonging to *H. Bennettii*, but though the ovaries shewed two corpora lutea, no direct communication existed between the median vaginal cul-de-sac and the urogenital passage, This paper does not contain much that is new relating to the point now under consideration, since the results recorded merely corroborate those arrived at by several previous observers, and, with the exception of Prof. Owen's article "Marsupialia" from Todd's Cyclopædia, and Prof. Lucä's paper, the writer seems to have been quite unaware of the literature of the subject.

Last summer during the visit of Mr. Forbes to Brazil, my friend Mr. J. J. Lister, B.A. of St, John's College Camb., performed the duties of Prosector at the Zoological Society's Gardens, London. Early in the summer a kangaroo (*H. ualabatus*) in the Collection died, which Mr. Lister dissected. In working over the female organs a direct communication between the median vaginal canal and the urogenital passage was found to exist. Two days afterwards my friend shewed me his careful notes and drawings, and not being able to gather any information relating to this species from the text-books and other authorities then at our disposal they were set aside for further consideration. Subsequently two other kangaroos in the Gardens died, and each of these also possessed a direct communication between the median vaginal canal and the urogenital passage, Now one of these kangaroos was a specimen of *M. rufus*, and as in the case of *H. ualabatus*, we could find no reference whatever to the condition of things in this species. The other animal was a specimen of *M. major*. In the meantime one of us had been

*Beiträge zur kenntniss des Urogenitalsystems der Marsupialen, Leipsig, 1880.

investigating literature at the British Museum Library, and finding our results to be so interesting we determined to publish them, together with any others that might come to hand. A draft of a joint paper embodying these and some other observations on specimens which Mr. J. W. Clarke, Superintendent of the Cambridge Museum kindly allowed us to make, and on the organs of a specimen of *Drendrolagus sp.* which died in the Zoological Gardens, was written, and on my leaving England in November last was left with Mr. Lister. Owing to pressure of work that paper was still unpublished at the date of my friend's last letter, and as I have not a copy of it with me I cannot give further details concerning it. Mr. Lister however tells me that he has had the opportunity of examining specimens of "*Petrogale sp.* in various stages with quite the macropine arrangement, *i.e.* closed before, and open after, having had young.

III. Further Observations.

The following account is founded on the examination of the organs of seventeen kangaroos shot by myself or by friends shooting in company with me, and of three kindly given me by my friend Mr. Morley. Acting on a suggestion made to Mr. Lister and myself, by our distinguished master Mr. F. M. Balfour, F.R.S., of Trinity College Cambridge, I have had recourse to section-cutting in some cases, with the most satisfactory results.

The animals from which the above mentioned organs came, are referable to three genera and as many species, *viz.* *Osphranter robustus*, *Halmaturus ruficollis*, and *Petrogale penicillata*. I am unaware of any published account of the female organs in any one of these three species, except in so far as the descriptions of *H. Bennettii* already given may apply to *H. ruficollis* of which the Tasmanian species is thought by Waterhouse to be merely a local variety. When Mr. Lister and I were looking at the specimens in the Museum of the Royal College of Surgeons, we noticed one which evidently shewed the direct communication, but on referr-

ing to the copy of the catalogue in the gallery no entry about it was to be found. On applying to Professor Flower for further information, that gentleman very kindly allowed us to see another copy of the catalogue which contained the following manuscript entry: "2740 D. The female organs of a small species of kangaroo *Macropus penicillatus*, showing a direct communication, through which a bristle is passed, between the common mesial cul-de-sac and the urogenital passage. In Museum before 1861."

In his article "Marsupialia" (*loc. cit.*) Professor Owen speaks of having received the impregnated uterus of an animal belonging to this species, but beyond the mere mention of it there, no further description is given.

Of my twenty specimens, twelve belonged to females with young in the pouch, four to females with large but empty pouches, and the remaining four to immature animals with rudimentary pouches and teats. Each of sixteen of them shews a direct communication between the mesial vaginal canal and the urogenital passage. In the remaining four the direct communication does not exist, though the condition of things is quite different from that in *M. major*, inasmuch as the tissue of the mesial cul-de-sac is continuous with that of the urogenital passage.

I shall now proceed to describe some of the specimens individually.

Osphranter robustus.—I have examined four specimens belonging to this species of which (*b.*) and (*d.*) were given me by Mr. Morley,

(*a.*) The organs belonged to a nearly full-grown female. There was no young one in the pouch which was large and appeared to have been recently tenanted. The right teat was very large and on squeezing it milk exuded from it.

The urogenital chamber was carefully slit up along its dorsal wall, beginning at the external orifice, and on laying back the cut edges the aperture of the direct communication was most

satisfactorily seen. There are also to be seen the two longitudinal ridges, which, starting from the inner side of the distal portion of each lateral canal, run along the ventral wall of the urogenital canal throughout its length. In this specimen in which the width of the canal was $\frac{5}{12}$ in., the ridges are $\frac{1}{8}$ in. apart and $\frac{3}{16}$ in. high, and, being situated one on either side of the middle line, their effect as seen from above is to divide the ventral moiety of the canal into three channels, viz. a median one blocked at its anterior end, and two lateral ones leading to the two lateral canals. The median channel is marked along its median line by a slight ridge, which, for the last quarter of an inch at its anterior end, increases gradually in height until at its extreme end it reaches the level of the ridge on either side of it. On this median ridge the apertures of the direct communication and of the urethra are situated. The latter is just upon $\frac{1}{4}$ in. from the anterior end of the ridge. The former which is situated a little to one side of the summit of ridge, is $\frac{1}{8}$ in. in advance of the meatus urinarius.

Besides the two longitudinal ridges there are several slight unsymmetrical ridges in the lateral channels. Home and Owen do not seem to mention these ridges in the urogenital passage, but Lucä has described them as seen in his specimens, and on the whole his description agrees very well with what I have seen. As Lucä points out when the free edges of these ridges are in contact the effect is to divide the urogenital passage into two divisions, one of which leads to the lateral canals, and the other to the median vaginal canal and the urethra.

(b.) These are the organs of an adult female, whose pouch was large and well developed but contained no young one. On slitting up the dorsal wall of the urogenital passage as before, the aperture of the direct communication was found to be larger and to have thicker lips than in the previous case. The ridges are just as in that specimen, except that they are somewhat thicker and flatter and consequently not so high.

(c.) These are the organs of a small female whose skin on the flat measures 27 inches from the tip of the nose to the base of the tail. Her skull shews but one premolar and two molars on each side of each jaw. The pouch and teats were rudimentary and the ovaries are destitute of corpora lutea. On these grounds in conjunction with the examination of sections I conclude that she had never brought forth young.

Having cut off the upper part of the mesial cul-de-sac, the lateral canals, and the lower part of the urogenital canal, the intervening part was sectionized, beginning at its proximal end.

The sections through the bottom of the cul-de-sac shew the presence of a longitudinal septum. On getting further down the sections still shew an aperture corresponding to that of the cul-de-sac in the earlier sections. It is considerably wider from side to side than the urethral aperture, through not quite so high from above downwards. It very gradually narrows from side to side until in sections in which the urogenital canal appears it diminishes to a mere pinhole situated in the middle line, between the urethra and urogenital passage but slightly nearer to the former and then finally disappears. Wishing to know where this took place the succeeding sections were carefully counted, until the meatus urinarius appeared, which was in the thirty-fourth section after the disappearance of the pinhole. In the last section in which it appears the hole is $\frac{1}{20}$ in. from the summit of the median ridge.

In Lucü's description of his young *H. Bennettii* he says that on carefully slitting up the wall of the median cul-de-sac and that of the urogenital passage towards one another, he found that while there was no communication between the two cavities their mucous membranes were separated from one another by a layer of connective tissue, at most $\frac{1}{8}$ mm. thick.

In his *Leçons de Comp. Anat.* Cuvier says, " en introduisant un stylet dans cette partie (median cul-de-sac) qui n'est plus

qu'un canal étroit chez le kanguroos—Téthys, je n'ai trouvé qu'une membrane très mince qui le séparait de la cavité correspondante du vagin, (urogenital passage) un peu au-dessous de l'orifice de l'urètre."

These two instances seem to me to show pretty much the same thing as my specimen.

(c.) These organs belonged to a small female with a rudimentary pouch and teats. On slitting up the urogenital canal there is no other aperture to be seen but that of the meatus urinarius. I have not been able as yet to sectionize this specimen, but in the mean time it would seem to be like the previous one.

Halmaturus ruficollis.—I have examined five specimens belonging to this species. Of four which I got myself, each had a young one in the pouch. The fifth had a large pouch but no young one. All five shew the existence of the direct communication between the median vaginal canal and the urogenital passage.

The ridges in this species have the same relative arrangement as in *Osphranter robustus*, but their height is not so great. In one case the two longitudinal ridges were not quite $\frac{1}{8}$ in. apart. There is slight variation in different specimens in the situation of the apertures both of the urethra and of the direct communication, since sometimes they are on the summit of the median ridge, at other times slightly to one or other side of it. In one specimen the median ridge was confluent with one of the lateral ridges and the two apertures were situated at the base of the compound ridge.

Petrogale penicillata.—I have examined the organs of eleven animals belonging to this species. Of these each of eight had a young one in the pouch, one had a large but empty pouch and two were young specimens with rudimentary pouches. Nine of these shew a direct communication between the median vaginal canal and the urogenital sinus. The ridges in this species are relatively as large and as well marked as in the previous cases.

There are also slight variations in the positions of the two apertures with regard to the median ridge. Except in one case these nine specimens call for no further comment. In the case referred to, on slitting up the urogenital passage but one aperture about $\frac{1}{4}$ inch long, which is longer than usual, was to be seen. On further examination this proved to be the aperture of a small cavity into which the two canals open, and on the wall of which the two orifices are easily made out.

The two remaining specimens at the time of their being shot were set aside as being probably in the virgin condition. In both cases the pouches and teats were rudimentary, the ovaries shew no corpora lutea, and the organs were so small that twenty sections from the region of the embouchures of the lateral canals are easily accommodated under a $\frac{3}{4}$ in. square cover-glass.

In the first of them examined the sections beyond the difference in size are very similar to the corresponding ones from No. (c.) *Osphranter robustus*. In sections in which the urogenital canal first appears, the prolongation of the cavity of the mesial cul-de-sac appears as an arc of a circle with its concavity towards the urethra. Its height from above downwards is about one half, and its width from side to side about twice, the corresponding measurements of the urethra. The following changes then take place. The width of the aperture from side to side gradually decreases, but on one side more than the other, until instead of projecting beyond the urethra on both sides it now does so on one side only. Next it appears split into four by transverse partitions, showing that the bottom of the cavity is nearly reached. The same thing happens in *Osphranter robustus*, No. (c.). Two of the holes then disappear, the remaining two being very small and situated to one side of the middle line. In the fifth section after this the cavity comes to an end, the last trace of it being situated just below and close to one end of the elliptical urethra. Two sections however before this happens there has become visible in the middle line, about half way between the urethra and the uro-

genital passage, a very minute transverse slit lined by epithelium, quite away from the aperture of the median vaginal prolongation. In the first two sections in which it appears the transverse slit is rather indistinct and all efforts with the high power to trace it in preceding sections have failed. In the eighth section after its first appearance it opens by a narrow duct into the urogenital passage.

In the other specimen the same condition as has been described in *O. robustus* No. (c,) was met with. That is the cavity of the mesial cul-de-sac gradually diminished in size and finally disappeared, and in the forty-second section after this the urethra entered the urogenital canal.

How to account for the difference between these two specimens, otherwise so much alike I do not know. In the first of the two there is certainly no direct communication. If there had been any signs of pregnancy the condition met with would have been perhaps more intelligible. As it is I refrain at present from making any further remarks in the hope of shortly having further opportunities of investigating this point.

In conclusion I have to thank my friends Messrs. Baker, Morley, and Webb for assistance in getting specimens and in other ways. I have also to thank Mr. Ramsay, F.L.S., of the Museum for his kind help in determining the species to which one of my specimens belonged.

DESCRIPTION OF TWO NEW SPECIES OF SNAKES.

BY THE HON. WILLIAM MACLEAY, F.L.S.

In the following paper I give the descriptions of two Snakes recently sent to Mr. E. P. Ramsay by his brother Mr. James Ramsay, both specimens taken on his station near Fort Bourke.

The first is one of the very venomous Family of *Elapidæ*, and is so distinct in many respects from all of the genus *Diemenia*